

REMARKS/ARGUMENTS

Favorable reconsideration of this application as currently amended and in view of the following remarks is respectfully requested.

Claims 1-7, 10 and 12-16 are currently active in this case. Claims 8 and 9 have been cancelled. Claims 1, 3, and 7 have been amended, and Claims 15 and 16 have been added by the current amendment. No new matter has been added. Regarding the changes to Claims 1 and 7, see by way of non-limiting example, page 25, lines 29-31 of the specification.

Regarding the change to claim 3, see by way of non-limiting example, page 14, line 5-page 15, line 5 and page 25, lines 29-31 of the Specification. Regarding newly added claim 15, see by way of non-limiting example, page 25, lines 12-14 of the specification. Regarding newly added claim 16, see by way of non-limiting example, page 25, lines 20-31.

In the outstanding Office Action, Claims 1 and 2 were rejected under 35 USC 103(a) as being unpatentable over U.S. Patent Publication No. 2003/0178144 to Ohmi et al. in view of U.S. Patent No. 6,053,984 to Petvai et al. and U.S. Patent No. 6,358,809 to Hampden-Smith et al.; Claims 3 -6, 9, and 10 were rejected under 35 USC 103(a) as being unpatentable over Ohmi et al. in view of U.S. Patent Publication No. 2003/0126872 to Harano et al. and U.S. Patent Publication No. 2003/0121608 to Chen et al.; and Claims 7 and 8 were rejected under 35 USC 103(a) as being unpatentable over Ohmi et al. in view of Harano et al., Chen et al. and U.S. Patent No. 5,660,047 to Paganessi; claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al. in view of Petvai et al., Hampden-Smith et al., and further in view of Chen et al.; and claims 13 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al. in view of Petvai et al., Hampden-Smith et al., and Chen et al., and further in view of U.S. Patent Application Publication No. 2002/0069968 to Keller.

Briefly recapitulating, the present invention (Claim 1 as amended) is directed to a plasma processor including, among other things, a cooling medium channel through which a

cooling medium cooling the process gas supply parts flows; and a cooling medium mixer to generate and supply the cooling medium to the cooling medium channel of a process gas supply part. A pressure of the cooling medium channel is 0.2 to 1.0 MPa. According to the cooling medium channel pressure of claim 1, it is possible to “maintain the amount of cooling” (page 25, lines 29-31 of the Specification) so that “it is possible to retain the temperature of the process gas supply part 30 in the range of, for instance, 100°C to 200°C” (page 25, lines 12-14 of the Specification) with more efficiency. The significance of this temperature range is described at, for example, page 16, lines 7-25 of the Specification.

Page 4 of the Office Action asserts that the coolant passage 31e of Ohmi et al. corresponds to the cooling medium channel of claim 1. Applicants disagree. Further, Applicants point out that Ohmi et al. fails to teach or suggest that a pressure of the coolant passage 31e is 0.2 to 1 MPa. Neither Petvai et al. nor Hampden-Smith et al. remedies this deficiency. In particular, Petvai et al. states at column 6, lines 5-8:

In operation, the wafer surface is initially cooled 340 (Fig. 10) by the application of a water mist from mist generator 43. This mist flow 35A cools the wafer surface, largely by evaporative cooling, to a temperature of about 10°C.

The official action asserts on page 9 that the claim 8 limitation pertaining to the pressure of the cooling medium channel is a functional limitation and hence has not given that limitation any weight. Applicants respectfully traverse. A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. See MPEP 2173.05(g). In this case, the substantial difference in the temperature of the object targeted for cooling (i.e., the temperature of processing gas supply part 30 in the present invention and the temperature wafer surface in Petvai et al.) suggest that Petvai et al. operated at a substantially lower pressure than the claimed pressure range of 0.2 to 1 MPa. Accordingly, in this respect, it is concluded that the Petvai et al. reference teaches away from the claimed

pressure range.

Hampden-Smith et al. is relied upon in the Office Action for using an ultrasonic wave to generate mist and use of a mixing part to mix the mist with a cooling gas. However, like Petvai et al., Hampden-Smith et al. fails to teach or suggest the claimed pressure range. Further, unlike the present application, none of the applied references recognized that the pressure of a cooling medium channel is a result-effective variable. Hence, it would not have been a mere matter of optimization to discover the claimed pressure range of the pressure of the cooling medium. See *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

For at least the reason set forth above, Petvai et al. and Hampden-Smith et al. do not remedy the deficiencies of Ohmi et al. Thus, those references fail to establish a *prima facie* case of obviousness for claim 1. Accordingly, the rejection of claim 1, as well as the rejection of claim 2 depending therefrom, should be withdrawn.

Claims 3-6, 9, and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al. in view of Hirano et al. and Chen et al.

Claim 3 has been amended to clarify that “the cooling medium includes a cooling gas and mist of H<sub>2</sub>O, and a pressure of the cooling medium channel is 0.2 to 1 MPa”.

The Office Action asserts on page 6 that Ohmi et al. discloses “a cooling medium”. However, Ohmi et al. fails to teach or suggest that the alleged cooling medium (coolant) “includes a cooling gas and mist of H<sub>2</sub>O”. The Office Action also asserts that the refrigerant of Harano et al. corresponds to the “cooling medium” recited in claim 3. However, Harano et al. also fails to teach or suggest that the alleged cooling medium (refrigerant) “includes a cooling gas and mist of H<sub>2</sub>O”. Chen et al. is also deficient in this regard.

Further, as discussed above regarding claim 1, Ohmi et al. fails to teach or suggest that a pressure of the coolant passage 31e is 0.2 to 1 MPa. Neither Harano et al. nor Chen et al. remedies this deficiency.

For at least the reason set forth above, the combination of Ohmi et al., Hirano et al. and Chen et al. do not teach or suggest each and every element of the claimed invention, thus failing to establish a *prima facie* case of obviousness regarding claim 3. Accordingly, the rejection of claim 3, as well as the rejection of claim 4 depending therefrom should be withdrawn.

Dependent Claims 5-7 and 12-16 are believed to be allowable for at least the same reasons that their respective independent claims are believed to be allowable. In particular, newly added claim 15 provides that the cooling medium circulator is configured to circulate the cooling medium to cool the processing gas supply part so that the processing gas supply part is maintained at approximately 100°C to 200°C. Newly added claim 16 defines pressure control means structure for maintaining the pressure of the cooling medium channel between 0.2 to 1.0 MPa.

In view of the foregoing, no further issues are believed to remain. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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